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BEES OF THE GENERA *HALICTUS* AND *CERATINA* FROM SIAM

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The bees recorded below, which will be found in The American Museum of Natural History, were collected a little more than ten years ago, but were set aside owing to the pressure of other matters. The Halictines may be separated by means of the following table:

1.—Green species, with black abdomen.....*speculibasis*, new species.
Black species.....2.
2.—Male; flagellum long and black; basitarsi pale yellow....*metenus*, new species.
Females.....3.
3.—With distinct apical hair-bands on tergites.....*fimbriatellus* Vachal.
Without such bands.....4.
4.—With evident basal hair-bands on tergites; tergites with dark margins; postscutellum covered with dense tomentum.....5.
Without such bands.....9.
5.—Larger species; disc of mesothorax highly polished.....*albescens* Smith.
Smaller; mesothorax duller, or quite dull.....6.
6.—Head longer than broad.....7.
Head not longer than broad.....8.
7.—Supraclypeal area highly polished.....*callorhinus*, new species.
Supraclypeal area not polished.....*nasicensis* Cockerell.
8.—Mesothorax dull; tegulae clear red.....*semivagans*, new species.
Mesothorax shining on disc.....*cattulus* Vachal = *vagans* Smith (sens. lat.).
9.—Larger species, wing over 6 mm.; mesothorax very highly polished and almost impunctate; postscutellum not covered by tomentum.
sutepinus, new species.
Otherwise.....10.
10.—Mesothorax dull (partly shining in *H. bambusarum*).....11.
Mesothorax shining; stigma reddish; postscutellum not covered with dense tomentum.....13.
11.—With some obscure metallic tints, conspicuous on posterior truncation of thorax; postscutellum densely tomentose; area of metathorax shining.
bambusarum, new species.
With no metallic tints.....12.
12.—Stigma dark brown; area of metathorax entirely dull.
latitarsis semiopacus, new subspecies.
Stigma dilute reddish; head very broad (*Pachyhalictus*).
puangensis, new species.

13.—Area of metathorax brilliantly shining posteriorly; hind basitarsi dark.
sutepellus, new species.

Area of metathorax not shining posteriorly; hind basitarsi red.
perihirtulus, new species.

Halictus (Pachyhalictus) puangensis, new species

FEMALE.—Length about 6.3 mm., anterior wing 5 mm.; black, very robust, the abdomen nearly 2.5 mm. across. Head very broad, as in *H. burmanus* Blüthgen, not evidently narrowed below, the vertex not elevated, the posterior ocelli, seen from in front, being on the line of the vertex (not below it, as in *H. intricatus* Vachal); mandibles reddish apically; flagellum red beneath, and the apical part somewhat reddened above; clypeus dull, with a pair of low bosses on lower margin, about as far apart as either from side of clypeus; supraclypeal area entirely dull; front dull, with very fine sculpture; vertex shining at each side of ocelli. Hair of head and thorax dull whitish, very scanty on head, very thin on mesothorax, dense and creamy white on postscutellum, dense on tubercles above and adjacent part of collar; margin leading to tubercles sharp and salient; mesothorax dull, entirely covered with a coarse raised network; scutellum dull and rough; area of metathorax very large, entirely dull, with very strong irregular plicae; posterior truncation dull, very broad, sharply bounded at sides and above; tegulae rather pale reddish. Wings dusky hyaline (compare *H. murbanus* Blüthgen), stigma dusky reddish brown, nervures pale, first recurrent reaching apical corner of the rather narrow second cubital cell. Legs black, with pale hair, small joints of front and middle tarsi reddish, hind tarsi entirely rather dark red. Abdomen with first tergite polished and shining; the other tergites dullish, the second and third with a very fine pruinose pubescence, giving a bluish appearance, a pale hair-band (only visible at sides) at base of second, and margins of second and third with the hair a little denser, giving the effect of faint bands; fourth tergite with a band of pale hair on each side, and the actual margin brilliantly shining; caudal rims and apical margin with dense, slightly yellowish, hair. Microscopic characters: apical part of first tergite with excessively weak, hardly visible sculpture, and bare, abruptly contrasting with the second, which is covered with appressed hairs; hind spur with about three small dark teeth on basal half, the apical half slender and simple; front finely lineolate and irregularly subreticulate, the sculpture weak, not at all like that of mesothorax; scutellum coarsely reticulate, like mesothorax; base of metathorax with large quadrate areas surrounded by raised margins, forming an excessively coarse network.

Siam: Kum Puang Creek, Jan. 26, 1928 (Cockerell).

In Blüthgen's table (1926) this appears to run best to *H. reticulosus* Dalla Torre, from which it is easily known by the character of the pubescence, with the pruinose second and third tergites of abdomen. There is some resemblance to *H. murbanus* Blüthgen, 1931, from Singapore and Sumatra, which has a similar head, but the pubescence and sculpture are different.

Halictus albescens Smith

Siam: Nan, Jan. 14 (Cockerell), one female.

This is *H. albescens*, as restricted in my table made from the types at

British Museum (Ann. Mag. Nat. Hist., July, 1930, p. 56). It is not *H. senescens* Smith or *H. lahorensis* Cameron.

Halictus (Indohalictus) latitarsis semiopacus, new subspecies

FEMALE.—Length about 5.5 mm., anterior wing 4.3 mm.; black, including mandibles, the flagellum very faintly brownish beneath; the scutellum, postscutellum and hind part of mesonotum appearing slightly greenish in contrast with the large, entirely dull, intensely black area of metathorax. Hair of head and thorax whitish, very scanty, but dense on tubercles, and a strong fringe along each side of metathorax. Abdomen shining black, without hair-bands; under side of abdomen with long yellowish hair. Wings hyaline, stigma very large, dark brown; second and third cubital cells very narrow, about equally wide; tegulae clear red. Very close to *H. mcgregori* Cockerell (Philippine Is.), and best regarded as a subspecies, but conspicuously smaller and less robust, with clearer wings, the smaller head with the face strongly shining on each side near the antennae. Typical *H. mcgregori* is 7 mm. long.

Siam: Mekami River, Feb. 2, 1928 (Cockerell).

Blüthgen (1926) considers *H. mcgregori* a synonym of *H. latitarsis* Friese, 1909, described from New Guinea. Blüthgen states that he has seen it also from Sumatra and the Philippine Islands. He states that the female is 6 to 6.5 mm. long. Friese's description does not seem to contradict the reference, and we may consider that there is one very widely distributed species involved. It is a member of Blüthgen's subgenus *Indohalictus*, most of the species of which have metallic colors.

Halictus sutepinus, new species

FEMALE.—Length about 7.3 mm., anterior wing 6.3 mm.; black, with the mesothorax, scutellum and abdomen highly polished, the pubescence whitish, very scanty. Head somewhat longer than broad, the face conspicuously narrower than in any of the fifteen species figured on Pl. v of Blüthgen's 1926 paper (Zool. Jahrb., Vol. LI); mandibles black; flagellum very obscurely brownish beneath; clypeus shining, with widely separated large punctures, and an indistinct median ridge; supraclypeal area convex, shining; front dull, except a shining band along orbits, and extending broadly to ocelli above; no hair covering sides of face. Mesothorax brilliantly shining, almost without sculpture, a strong median groove on anterior half; scutellum smooth and polished, bigibbous, with a median depression; postscutellum dull, not covered with dense tomentum, the surface showing; area of metathorax large, with strong regular plicae, and a thick posterior margin; posterior truncation dullish, not sharply margined at upper part of sides; mesopleura highly polished, with very weak sculpture; tegulae very dark, almost black. Wings dusky hyaline, iridescent; stigma and nervures dark brown, outer nervures not much weakened, but lower side of third cubital cell very weak; lower apical corner of second cubital cell acutely pointed; first recurrent nervure meeting intercubitus. Legs black; hind femora with a large curled floccus; hind tibiae with long curled hairs beneath, these plumose, with exceedingly long branches; on outer side the hind tibiae have short black spines. Abdomen long-oval, smooth and highly polished, except

that the second and third tergites have a broad dull band at base; no hair-bands, but sides of abdomen with glittering white hairs, and apex with dark hair; venter with long thin white hair. Microscopical characters: hind spur with five rather short oblique teeth; scutellum smooth and polished, the disc impunctate, but with a median groove, and some strong punctures along hind margin; postscutellum with the surface finely wrinkled, with fine irregular plicae; area of metathorax large, not sharply banded in middle behind, its surface with about 22 long plicae, which are rather irregular, with some little side branches, the surface beyond the plicae shining; upper part of front finely and closely punctured, the punctures running more or less in rows.

Siam: Doi Sutep Mountain, Feb. 9, 1928 (Alice Mackie).

I have not found any very close relative of this striking species. It resembles such species as *H. albipes* Fabricius, and differs from most of the Siamese forms, in having the surface of postscutellum exposed, not covered with dense tomentum. In Bingham's table (Fauna Brit. India) it goes to *H. gutturosus* Vachal, which is the male of *H. fimbriatellus* Vachal, and is not at all allied. In my table of Philippine Islands species (Phil. Jour. Sci., XV, 1919) it runs out at 16, on account of the dark tegulae. It does not agree with any of Blüthgen's species; it seemed to run near to *H. tenasserimicus* Blüthgen, but the shape of the head differs, and the antennae are quite differently colored.

Halictus metenus, new species

MALE.—Length about 6 mm., anterior wing 4.7 mm.; black, with an apical band on clypeus (not having any upward projection), the labrum (except margin) and an elongated mark on each mandible cream color. Head approximately circular seen from in front; orbits strongly converging below; face, front and cheeks with abundant grayish-white hair; clypeus dullish; upper part of front bare and very black, entirely dull; vertex shining, not elevated; scape all black; flagellum very long, obscurely brownish beneath. Mesothorax dullish, but shining on disc, with quite dense distinct punctures; scutellum strongly shining on disc; postscutellum densely covered with long grayish hair; area of metathorax poorly defined, broadly polished at sides and posteriorly, but the basal part with strong plicae; posterior truncation small, moderately shining, sharply defined at sides; middle of mesopleura strongly shining; tegulae amber color. Wings long, grayish-hyaline, stigma dark brown; nervures pale brown, outer nervures not weakened; second cubital cell broad, receiving recurrent nervure before end. Knees and basitarsi light yellow; anterior tibiae in front, the others at extreme apex, and small joints of tarsi, pale reddish. Abdomen highly polished, first tergite not evidently punctured under a lens; second and third tergites with narrow obscure grayish basal bands, weak in the middle. Microscopic characters: third antennal joint very short, not quite so long as second; punctures of mesonotum largely running in rows; posteriorly, the mesonotum has strong close punctures, and a little band of hair along hind margin; the scutellum is in complete contrast, with extremely small punctures, and these lacking or nearly so on disc; the area of metathorax has about ten well separated plicae; first tergite polished, with excessively minute scattered punctures, but second completely contrasting, rugosopunctate all over, though with a lens the difference is hardly noticeable.

Siam: Nan, Dec. 31, 1927 (Cockerell).

This cannot possibly be the male of any species recorded from the female in this paper. In Bingham's table it runs to *semiaerinus* Vachal (*splendidulus* Vachal), but it really resembles *H. philippinensis* Ashmead (*vagans* Smith), differing by the much longer antennae, darker stigma and different area of metatorax. In a table by Blüthgen it runs to *H. massuriensis* Blüthgen, which is much larger. It is not like any of the males described by Blüthgen in 1928; thus as compared with *H. vulcanius* Blüthgen, the vertex is not so elevated, the face is not so broad below and the clypeus is less produced. The orbits converge below much more than in *H. perakensis* Blüthgen. In the European fauna it falls nearest to the larger *H. laevigatus* Kirby, according to the tables, but it is really entirely different. The specific name is derived from a Malay word meaning black.

I saw *H. perakensis* and *H. vulcanius* in the Museum at Kuala Lumpur, and noted:

H. perakensis.—Small, very shiny black male, head oblong, face narrow; clypeus shining and all black, produced, apical corners projecting; area of metathorax long, dull, minutely roughened; wing with very large dark brown stigma; legs dark; abdomen brownish toward base.

H. vulcanius.—Small, slender, very shining male, its clypeus transverse, all black; supraclypeal area polished, prominent; scutellum highly polished; area of metathorax dull, little sculptured; legs dark brown; abdomen brown.

In some ways more related to *H. metenus*, but very much larger, is *H. polygamus* Blüthgen, which I saw at the same Museum, and of which I noted (male):

H. polygamus.—Larger than *H. impudicus* Blüthgen; apex of clypeus broadly yellow; antennae very long, dark, faintly reddish; prothorax angulate on each side above, and above angle white tomentum; mesothorax and scutellum all dull; hind basitarsi and base of tibiae yellow.

Halictus fimbriatellus Vachal

Siam: Nan, females, Dec. 28, 1927, flying about *Mimosa pudica* (Cockerell); Jan. 3, 1928 (Cockerell); Jan. 4 (Alice Mackie).

Halictus (Evylaeus) semivagans, new species

FEMALE.—Length about 6.5 mm., anterior wing 5 mm.; black, including mandibles, antennae (flagellum obscurely reddish apically) and legs (tarsi reddened at ends). Hair of head and thorax thin, with a hardly perceptible fulvescent tint dorsally; head broad, but clypeus prominent; clypeus and supraclypeal area dull, but sides of face shining; front entirely dull, vertex shining; cheeks with conspicuous white hair. Mesothorax dull, with dense very fine punctures; scutellum shining, with a median depression; postscutellum densely covered with fulvescent tomentum;

area of metathorax rather short, shining, with fine close parallel plicae which reach the hind margin (style of *H. perhumilis* Cockerell); posterior truncation shining, sharply defined all round, its upper corners angular; mesopleura dull; tegulae amber color. Wings hyaline, stigma pale reddish testaceous, nervures pale, the outer nervures faint as in *Evylaeus;* second cubital cell broad, receiving recurrent nervure a fair distance from end. Abdomen with first tergite polished, the others duller; tergites 2 to 4 with basal bands of gray tomentum, very conspicuous, but visible only at sides of second when abdomen is contracted; apex with pale hair. Microscopic characters: apical part of first tergite with very fine punctures and extremely minute transverse striae; hind spur with three long shining spines.

Siam: Type from Ban Maa Hia, Feb. 11, 1928 (W. P. Cockerell). Also from Pahtoop Mountain, Jan. 11, at flowers of *Convolvulus* (Cockerell).

This is close to *H. vagans* Smith, but not the same. By the color of the tegulae it should be the allied *H. cuniculus* Vachal, but it cannot at all be reconciled with Vachal's description. In Blüthgen's table it runs to *H. pheidolopsis* Blüthgen as to sculpture, but abdomen is quite different; on abdominal bands to *H. burmensis* Blüthgen, but is otherwise different. It differs from *H. nasicensis* Cockerell in having the clypeus not shiny, and the area of metathroax different, of the type of *H. perhumilis* Cockerell. Blüthgen regards both *H. nasicensis* and *H. perhumilis* as forms of *H. vagans,* but I am not persuaded that this is correct.

Pahtoop Mountain, where we found *H. semivagans,* is a rounded limestone hill rising abruptly from the surrounding forested country, not far from Nan. It is rich in molluscs, and we collected there (determined by Tomlin) *Macrochlamys hainesi* V. Mts., *Megaustenia siamensis* (Haines), with varieties *albescens* Cockerell and *virescens* Cockerell, *Haploptychius petiti* Gould, *Cyclophorus aquilus* Sowerby, *Prosopeas anceyi* Pilsbry, *Limnaea spadicea* Morlet, and *Indoplanorbis exustus* (Deshayes). We found a cave, in which were numerous Orthoptera of the genus *Tachycines,* a fly (*Sphaerophoria indiana* Bigot), and an interesting beetle, *Hylophilus kempi* Blair. The last was found by Miss Mackie, Jan. 10, in darkness. The other locality for *Halictus semivagans,* Ban Maa Hia, is near Chiengmai.

Halictus (Evylaeus) sutepellus, new species

FEMALE.—Length about 5 mm., anterior wing 4.3 mm.; black, rather slender, with very scanty pubescence, not forming spots or bands on abdomen. Head approximately circular seen from in front; mandibles black, flagellum dull red beneath; clypeus and supraclypeal area shining; lower sides of face, and also vertex, shining, but front dull, densely punctured. Mesothorax highly polished, with a median groove anteriorly, the microscope shows sparse minute punctures; scutellum shining; postscutellum minutely sculptured, not covered by tomentum; area of metathorax

hardly defined, the basal half with very fine irregular, partly anastomosing, rugae, this followed by a dull, transversely rugulose zone, and then by a broad polished one; mesopleura shining on disc, well punctured; posterior truncation of thorax well defined laterally; tegulae dark in front, red posteriorly. Wings dusky hyaline, stigma dark reddish; nervures very pale, appearing brown under microscope, the first recurrent joining extreme apical corner of second cubital cell. Small joints of tarsi rufescent; hind spur with three dark brown oblique spines. Abdomen polished, the first tergite impunctate, but less than basal half of second with fine punctures, this basal area, under a lens, appearing dull and black, contrasting with the shining, almost brassy, surfaces in front of and behind it.

Siam: Doi Sutep Mountain, Feb. 8, 1928 (Alice Mackie).

This rather closely resembles *H. lionotulus* Cockerell and *H. scintillans* Cockerell, from the Philippine Islands, but is separated by the non-tomentose postscutellum and the characters of the abdomen. *H. gedensis* Cockerell, from Java, is also allied.

Halictus (Evylaeus) perihirtulus, new species

FEMALE.—Length about 5.5 mm., anterior wing 4.3 mm.; black, including mandibles, antennae (the flagellum obscurely brown beneath), and legs, except that the hind tarsi are clear red, and the other tarsi reddish, but much more dusky; pubescence scanty, grayish white. Head seen from in front approximately circular; clypeus polished, with the lower marginal area roughened, and a sort of transverse ridge across the middle, only visible when looked at rather from above; sides of face shining, and even the front with a sort of sericeous lustre, the surface minutely and very densely punctured; vertex shining. Mesothorax small, finely and densely punctured, but shining; scutellum dullish, with a shining space on each side of disc; postscutellum minutely sculptured, the surface exposed, not covered with dense tomentum; area of metathorax very large, with very fine plicae or striae, the apical part not shining; under the microscope the area is hardly defined, covered with very delicate anastomosing rugae, the apical part with very fine curved transverse rugae on a minutely sculptured surface; posterior truncation well defined, feebly shining; mesopleura dull and rough; tegulae rufous. Wings hyaline, stigma red, nervures pale; second cubital cell broad, receiving recurrent nervure near end. Extreme base of front tibiae red; hind spur with two strong spines, on basal half. Abdomen broad, shining, hairy at sides and apex, but without hair-bands or spots; hind margins of tergites obscurely brownish; first tergite with extremely minute punctures, and transverse striae; second and third with the same type of sculpture.

Siam: type from Kum Puang Creek, Jan. 26 (Cockerell). One from Mckami River, Feb. 3 (Cockerell), has the flagellum clear red beneath, and the tegulae amber color, but it seems to be only a variety. One from Nan, Jan. 13 (Cockerell), is small, with amber-colored tegulae, and mandibles red in middle. It is possible, but not probable, that these other specimens represent different species.

This species is known from most of the small Siamese forms by the lack of conspicuous tomentum on postscutellum. I had at first confused

it with *H. sutepellus*, from which it is easily known by the dull apical part of metathoracic area. It seems near to *H. cavillosus* (Vachal), which was fully described by Blüthgen, but it differs at once in the hind spur and the pubescence of thorax. In my table of Philippine Is. species it runs to *H. mcgregori* Cockerell (*latitarsis* Friese, according to Blüthgen), but that is larger, with much darker stigma, and other distinguishing characters. Also, by the moderately shining mesonotum it should probably run better to *H. melanurops* Cockerell, which is much larger and quite different.

The specific name refers to the characteristic appearance of the abdomen, seen from above, with outstanding pale hair all around.

Halictus (Evylaeus) nasicensis Cockerell (variety?)

Siam: Nan, female, Jan. 14 (Alice Mackie).

This is so close to *H. nasicensis*, from N. W. India, that I cannot venture to separate it. It is about 5.5 mm. long, anterior wing 3.8 mm. It differs from *H. philippinensis* Ashmead (specimen compared with type) by the conspicuously smaller and narrower head. They agree in having the supraclypeal area dull, whereas in the specimens from Nan ascribed to *H. vagans* Smith, the supraclypeal area is shining. The dull mesothorax, the sculpture of scutellum and the striatulate front are also characters to separate it from typical *H. philippinensis*. The microscopical characters are: front microscopically striate; mesothorax with numerous small but very distinct punctures on a minutely tessellate surface; scutellum with extremely minute punctures, much smaller than those of mesothorax; area of metathorax crescentic, well defined, covered with irregular partly anastomosing plicae; hind spur with three stout spines; first tergite with very distinct, rather close, fine punctures on apical portion, but the base has only excessively minute piliferous punctures.

Granting that this insect should be referred to *H. nasicensis*, and separated from *H. vagans* or *philippinensis*, it still remains a question whether, as Blüthgen held, *H. nasicensis*, along with *H. emergendus* Cameron, 1908, should be referred to *H. matheranensis* Cameron, 1907.

Several years ago I made a table of Indian *Halictus* with black head and thorax, from the specimens in the British Museum, as follows:

1.—Abdomen at least partly red ..... 2.
Abdomen not at all red ..... 4.
2.—Abdomen highly polished; first three tergites chestnut red; no hair bands; nervures pale, outer recurrent and intercubitus very weak; second cubital cell broad (Simla) ..... *indicus* Cameron, type [= *himalayensis* Bingham].

Abdomen less polished; first two tergites ferruginous, third, dark, contrasting.....3.

3.—Wings pale brownish; second tergite not blackened laterally; abdomen with basal bands of tomentum on tergites 2 to 4.
deesanus Cameron, type [= *serenus* Cameron].

Wings clear; second tergite with a blackish patch on each side; second cubital cell much broader than in *H. deesanus* (Matheran).
latisignatus Cameron, type.

4.—Legs pale yellowish fulvous (female); anterior femora dark; nervures and stigma extremely pale; a small species of the subgenus *Seladonia*...*clarus* Nurse.

At least all the femora dark.....5.

5.—Males.....6.

Females.....7.

6.—Area of metathorax with very coarse rugae; sides of face with pure white hair (Himalayas).....*carianus* Cameron, type [= *feai* Vachal].

Smaller; area of metathorax dull and minutely roughened; all the tarsi pale reddish yellow.....*constrictus* Smith, type [syn., *paris* Bingham].

7.—Area of metathorax with very coarse vermiform rugae; wings reddish; mesothorax very distinctly punctured; abdomen very broad, tergites 2 to 4 with white basal hair bands (Salween Valley, Tenasserim)...*dasygaster* Vachal.

Area of metathorax not thus sculptured.....8.

8.—Stigma rufofuscous, dark; clypeus and supraclypeal area highly polished; hind margins of tergites hyaline.....*nireus* Bingham [= *salutator* Cameron].

Stigma pale reddish or yellowish.....9.

9.—Smaller; tegulae clear rufotestaceous; postscutellum densely covered with pale ochreous-tinted tomentum (Matheran)....*matheranensis* Cameron, type.[1]

Larger; tegulae darker.....group of *H. albescens* Smith.

Without further reference to the specimens, it is impossible to say how many species or races are included in the series which Blüthgen refers to *H. vagans* Smith. Indeed, we cannot expect to reach certainty until good series, including both sexes, have been collected in the different localities. The synonymy quoted in the above table is due to Blüthgen.

Halictus (Evylaeus) callorhinus, new species

FEMALE.—Length about 5.3 mm., anterior wing 4.7 mm.; black, with thin grayish hair, the second and third tergites with rather narrow basal bands of grayish tomentum; mandibles black; flagellum with a hardly perceptible brownish tint beneath; tegulae dark brown, paler posteriorly. Wings rather dusky hyaline, stigma brown, nervures pale. Head suboval, but fairly broad; clypeus moderately shining, with a series of elongated grooves on lower part; supraclypeal area convex, highly polished, contrasting with all the surrounding parts; front moderately shining, with exceedingly delicate reticulate sculpture (as seen under microscope); vertex with a very broad polished area on each side of ocelli. Mesothorax shining, but punctured; scutellum brilliantly polished; postscutellum densely covered with tomentum;

[1] I further noted of *H. emergendus* Cameron, type, from the same locality: stigma pale fulvous; tegulae light rufotestaceous; area of metathorax shining, with raised lines. A little larger than *H. matheranensis*, but the same species.

area of metathorax large, hardly defined, shining, with strong plicae on basal half (compare *H. semisculptus* Cockerell); posterior truncation narrow, shining at upper end, sharply defined all around, the upper corners evenly rounded; mesopleura dull and rough, somewhat shining on disc. Second cubital cell broad, receiving recurrent nervure before end. Legs somewhat brownish, the tarsi reddish at end; hind spur very pale, with two very large spines, which are broadened apically (subspatulate), and a long keel-like lamella. Abdomen broad, first tergite highly polished, practically impunctate, except for a band of fine punctures in the subapical region; second tergite polished on basal third, duller and more sculptured beyond.

Siam: Nan, Dec. 31, 1927 (Cockerell).

A species of the *H. vagans* group, but amply distinguished by the shape of the head, the sculpture of the front and the peculiar hind spur. In my table of Philippine Islands species, it runs exactly to *H. philippinensis*, from which it is easily known by the polished supraclypeal area and other characters. Also, the stigma is more obtuse at end.

Halictus (Evylaeus) bambusarum, new species

FEMALE.—Length about 6 mm., anterior wing about 5 mm.; black, robust, the dull posterior truncation of metathorax distinctly green; pubescence grayish, the postscutellum covered with dense tomentum, the abdomen with some very long hairs at sides of third and following tergites, and triangular patches of light tomentum at lateral bases of second and third tergites; mandibles black, faintly reddish apically; flagellum obscurely brown beneath; tegulae translucent rufotestaceous; wings hyaline, a little grayish; stigma reddish brown; nervures pale. Head broader than long; clypeus dull, depressed in middle, the apical part minutely striate; supraclypeal area flattened, large, dull, the microscope showing punctures and extremely minute longitudinal striae; at each side of supraclypeal area is a little polished space; front dull, in middle appearing very black, the microscope shows here a very dense striate-punctate sculpture, but at sides a very minute reticulation; vertex polished. Mesothorax dull in front, shining posteriorly, with a faint suggestion of greenish; in front the microscope shows very weak piliferous punctures on a minutely tessellate surface, posteriorly the punctures can be seen with a lens; scutellum highly polished; area of metathorax large, shining, with very distinct irregular radiating plicae, some with lateral branches; posterior truncation with its upper corners obtusely angular; mesopleura dull and rough in front, shining posteriorly. Second cubital cell broad, receiving recurrent nervure a considerable distance from end. Legs black, with pale hair, tinged with yellow on inner side of tarsi; hind spur reddish brown, with three very long spines. Abdomen broad, first tergite highly polished, second a little duller on apical half, the others dullish; the first tergite has extremely minute scattered punctures, as seen under microscope.

Siam: near Weing Sa, Dec. 25, 1927, on bamboo foliage (Cockerell).

Resembles in a general way *H. itaminus* Cockerell, from the Philippine Islands, but that is larger, with quite different area of metathorax, and dark tegulae. The smaller size and dullish posterior truncation of metathorax distinguish it from *H. postlucens* Cockerell. I have compared it with *H. gedensis* Cockerell, from Java, and it is quite distinct.

Halictus vagans Smith

Siam: Nan, Dec. 31, Jan. 8, Jan. 24, females (Cockerell).

These specimens agree with *Halictus philippinensis* Ashmead, 1905, which Blüthgen in 1926 declared to be a synonym of *H. cattulus* Vachal, 1894 (*catullus* by error in Bingham, Fauna Brit. India). In 1928, Blüthgen placed *H. cattulus* as a synonym of *H. vagans* Smith, 1858, described from Borneo, having been collected by Wallace in Sarawak. Smith called it *H. vagans* because it looked very like the European *H leucozonius*, and so seemed like a wanderer from northern regions. *H. philippinensis* is so much smaller than *H. leucozonius* that the comparison does not seem apt. I do not feel sure that the lengthy synonymy proposed by Blüthgen is really justified, but not having compared the types I am not in a position to correct him.

Halictus (Chloralictus) speculibasis, new species

FEMALE.—Length 5.5 mm., anterior wing 4.5 mm.; head dark green, with the clypeus black; thorax black, with the mesothorax and scutellum blue-green; abdomen black, the tergites beyond the first with very broad brownish margins; tegulae translucent reddish-testaceous; wings grayish hyaline, stigma pale dull testaceous, nervures very pale; legs dark brown, the tarsi pallid apically. Head broader than long; apical half of mandibles red; flagellum obscurely reddish beneath; clypeus shining, well punctured, flattened in middle, with a little tubercle at each apical corner; supraclypeal area not polished; front mainly dull, but a shining space (much more shining than clypeus) on each side next to antennae; vertex polished and shining; hair of head and thorax dull white, thin. Mesothorax with an impressed line, shining on disc, finely punctured; scutellum highly polished on disc; postscutellum large, entirely dull black; area of metathorax poorly defined, finely plicatulate at base, swollen and shining behind; posterior truncation shining, sharply defined all round. First recurrent nervure ending not far from end of first cubital cell; outer recurrent and intercubitus much weakened. Legs with abundant whitish hair, a red brush at end of hind basitarsi. Abdomen broad, first tergite highly polished, appearing impunctate under a lens, second tergite shining and perhaps slightly greenish at base, dull beyond, and the following tergites also dullish; bases of tergites hoary with fine tomentum, on third especially forming an entire rather conspicuous band, and practically the same on fourth. Microscopical characters: front very minutely but sharply striate-reticulate; a slender keel between antennae; plicae of metathoracic area strongly wrinkled (much the style of *H. xystonotus* Vachal); tegulae not punctured; hind tibiae on inner side with long loose strongly plumose hairs; hind spur with three long spines; first tergite with excessively minute well separated punctures, tending to run in rows; punctures of second tergite similarly minute.

Siam: Nan, Dec. 30, 1927 (Cockerell).

Apparently near to *H. paradnanus* Strand, from Ceylon, but distinguished by the dark antennae and the sculpture of the mesothorax. The tegulae and other characters readily separate it from *H. serratus* Blüthgen. The wings at once distinguish it from *H. buccinus* Vachal.

Ceratina (Ceratinidia) incertula, new species

FEMALE.—Length about 6.7 mm., anterior wing 4.3 mm.; black, with chrome-yellow marks as follows: apical band on clypeus connected with a broad vertical band which is subtruncate at upper end, but not at all notched, the distance between the vertical band and the lateral marks considerably less than the width of the band, and also less than width of lateral marks at that point; long lateral face-marks, broadened below (with no inwardly directed point), narrow above, the upper end, well above level of antennae, curving away from orbit; long transverse supraclypeal band; two large spots on front; mark on lower half of scape; broad band on cheeks, pointed at upper end; band on prothorax, nearly failing in middle, but laterally connected with the yellow tubercles; four slender lines on mesothorax, the lateral ones very short; scutellum (but not axillae); broad band on first tergite, very deeply incised on each side of middle by a large black spot; slender line on second tergite, connected with a large spot at each side; broadly interrupted band on third tergite, enlarged laterally; fourth tergite with a pair of claviform marks, separated only by a line in middle; fifth with a band which is very broad in middle, abruptly narrowed at sides, not reaching lateral margins. Sixth tergite, labrum, mandibles and flagellum all black; no yellow spot behind tubercles. Sides of mesonotum with the anterior half entirely dull and densely and minutely punctured, the posterior half mainly polished, but a broad dull densely punctured band runs across hind end of mesonotum; disc of mesonotum with distinct punctures, well separated on a shining ground; tegulae rufotestaceous. Wings dusky, stigma and nervures reddish brown; basal nervure meeting nervulus. Anterior coxae large, with a rounded tubercle at upper end; all the knees, front and middle tibiae on outer side, and stripe on basal half of hind tibiae, lemon yellow; anterior tibiae red in front; tarsi light red; hind tibiae with copious pale hair.

Siam: Nan, Jan. 13, 1928 (Alice Mackie).

In my table in Ann. Mag. Nat. Hist., March, 1919, p. 246, this runs to *C. incerta* Cockerell, from which it is easily known by the yellow on middle and hind legs. It approaches *C. laosorum* Cockerell, 1929, also found at Nan, but that species has the vertical band of clypeus notched at upper end, scape all black and mesothorax without yellow lines. Another related species is *C. corbetti* Cockerell, 1929, from Kuala Lumpur, but this differs in the pattern of the legs and other characters. The stigma of *C. corbetti* is much darker.